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Mark Thompson

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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT

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1794

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/510,898	Applicant(s) THOMPSON, MARK	
	Examiner Marie R. Yamnitzky	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-17, 29, 31, 35, 36, 40, 46, 48-55, 78, 81-84, 86, 87, 89, 92-94, 96, 97, 99 and 102 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 6-17,29,31,35,36,40,46,48-55,78,81-84,86,87,89,92-94,96,97,99 and 102.

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1. This Office action is in response to applicant's amendment filed August 20, 2009, which amends claims 6, 13, 14, 17, 29, 31, 35, 36, 40, 46, 48-55, 78, 83, 86, 87, 89, 92-94, 96, 97, 99 and 102, and cancels claims 1-5, 18-28, 30, 32-34, 37-39, 41-45, 47, 56-77, 79, 80, 85, 88, 90, 91, 95, 98, 100 and 101.

Claims 6-17, 29, 31, 35, 36, 40, 46, 48-55, 78, 81-84, 86, 87, 89, 92-94, 96, 97, 99 and 102 are pending.

2. The rejection under 35 U.S.C. 102(b) based on Kim (US 4,618,453) as set forth in the Office action mailed February 20, 2009 is partly rendered moot by claim cancellation and otherwise overcome by claim amendment.

The rejection under 35 U.S.C. 102(b) based on Lim (US 4,066,569) is partly rendered moot by claim cancellation. It is the examiner's position that the Lim reference remains applicable against some of the pending claims as set forth later in this action.

The rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) based on Kido et al. (EP 1 011 155 A2) are partly rendered moot by claim cancellation and otherwise overcome by claim amendment.

The rejection under 35 U.S.C. 102(b) based on Hsieh (US 5,853,906) is partly rendered moot by claim cancellation. It is the examiner's position that the Hsieh reference remains applicable against some of the pending claims as set forth later in this action.

The rejection under 35 U.S.C. 103(a) based on Swager (US 7,186,355 B2) is partly rendered moot by claim cancellation. It is the examiner's position that the Swager reference remains applicable against some of the pending claims as set forth later in this action.

3. Claims 78, 81, 92 and 102 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Support for an electron transporting material as claimed in present claims 78, 81, 92 and 102 is not clear. Claim 78 has been amended to recite 27 transition metals whereas the specification only teaches five of those recited metals (the five recited in claim 82) with respect to the embodiment in which the dopant is incapable of transferring charge to the organic matrix except when the dopant is optically excited (see paragraphs [0071]-[0072] on page 23 of the specification).

4. Claims 78, 81, 82, 92 and 102 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The only description pertaining to the electron transporting material of claims 78, 81 and 82, with claim 92 drawn to a device comprising the material and claim 102 drawn to a method in which the material is used to make a device, is in paragraphs [0071]-[0072] on page 23 of the specification. These paragraphs provide little information beyond what is stated in claims 78, 81 and 82. While paragraph [0072] indicates that organometallic compounds of Ir, Re, Os, Pt or Au may be used as optically activated dopants, it is not clear whether all organometallic compounds of any of these metals would meet the limitations of the organometallic dopant required, for example, by independent claim 78. It is not clear if Ir, Re, Os, Pt and Au are the only metals suitable for optically activated organometallic dopants (paragraphs [0071]-[0072] do not disclose the other metals recited in present claim 78). It is also not clear what ligands may be used to make optically activated organometallic dopants. Paragraphs [0071]-[0072] do not disclose any specific ligands suitable for optically active dopants. It is not clear if all of the ligands described in reference to other embodiments are also suitable for making the optically activated organometallic dopants.

5. Claims 83 and 93 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitations of claims 83 and 93 are unknown because these claims depend from claim 1, which has been cancelled.

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6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 6, 11, 31, 35, 36, 40, 46, 48, 50 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Lim (US 4,066,569).

Lim teaches compositions doped with metallocenes such as ferrocenes, which may be substituted. For example, see column 3, lines 4-29 and the claims. Lim's compositions meet the limitations of a charge transporting material according to at least present claims 6, 11, 31, 35, 36, 40, 46, 48, 50 and 51.

8. Claims 6, 9-13, 15, 31, 36, 46, 48, 54, 55, 84, 86, 87, 89, 94, 96, 97 and 99 are rejected under 35 U.S.C. 102(b) as being anticipated by Hsieh (US 5,853,906).

Hsieh discloses a conductive coating composition comprising a charge transport component, a polymer binder, and an oxidized oligomer salt. The conductive coating composition may be used in an electroluminescent device (e.g. see column 2, lines 49-54 and claim 7). The oxidized oligomer salt may be an oxidized oligo-metallocene salt as described at c. 25, l. 23-43. This metallocene compound meets the limitations of the organometallic dopant required by the rejected claims. In particular, with respect to claims 46, 48, 54 and 55, the metallocene is a dopant having the formula set forth in claim 46 wherein M is Fe or Co, and the

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two cyclopentadiene rings (L^1 and L^2) are covalently linked by alkyl (wherein Z of the prior art formula is methylene or ethylene), aryl (when Z is phenylene) or silyl (when Z is either of the Si-containing linking groups).

The metallocene compound is taught for use in combination with materials within the scope of present claims 12, 13 and 15 (e.g. see c. 25, l. 46-c. 27, l. 60).

Amounts of metallocene within the range set forth in present claim 10 are provided by the weight percent ratios set forth at c. 27, l. 60-65.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 7, 8, 14, 29, 35, 40 and 49-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (US 5,853,906) as applied to claims 6, 9-13, 15, 31, 36, 46, 48, 54, 55, 84, 86, 87, 89, 94, 96, 97 and 99 above, and for the further reasons set forth below.

With respect to claims 7, 8 and 29, Hsieh does not limit the ionization potential of the metallocene relative to the LUMO energy level of the materials with which the metallocene is mixed, but it would have been within the level of ordinary skill of a worker in the art at the time of the invention to select appropriate combinations of materials to provide a conductive

composition. One of ordinary skill in the art would have been guided in the selection of materials based on the intended end use of the conductive composition.

With respect to claim 14, Hsieh does not explicitly teach any of the specific materials recited in claim 14, but does teach carbazole compounds (c. 25, l. 48). The third material named in claim 14 is a charge-transporting carbazole compound that was known in the art at the time of the invention. It would have been within the level of ordinary skill of a worker in the art at the time of the invention to utilize known charge-transporting compounds within Hsieh's guidelines.

With respect to claims 35, 40 and 49-53, absent a showing of unexpected results commensurate in scope with the claims, it is the examiner's position that it would have been an obvious modification to one of ordinary skill in the art at the time of the invention to use substituted derivatives of metallocenes disclosed by Hsieh. It would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable substituents to provide conductive compositions similar to those provided by the metallocenes disclosed by Hsieh.

11. Claims 6, 12, 15-17, 36 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swager (US 7,186,355 B2).

Swager discloses conducting polymers having metallocenes incorporated into the main chain of the polymer. Given the conducting polymer structure in claim 1 of the patent, polyphenylenevinylenes having an organometallic dopant covalently attached to the polymer would have been *prima facie* obvious to one of ordinary skill in the art at the time of the

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invention. Such polymers are within the scope of the formula in patent claim 1 wherein L is a π -arene ligand, A and/or C is a phenylene group (which would *prima facie* given the rest of Swager's disclosure). Although claim 1 does not depict double bonds between the carbons in -CC-M-CC- (as would be required for vinylene), polymers having double bonds between the carbons would have been obvious to one of ordinary skill in the art given the requirement that the polymer be conductive and given Swager's teachings such as at column 5, lines 38-59 (especially line 54, where "poly(arylene vinylene)" is taught).

With respect to claim 17's requirement that the polyphenylenevinylene be cyano-substituted, and claim 40's requirement that the arene ligand be substituted, it would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable substituted derivatives capable of being used for the purposes of Swager's conducting polymers.

12. Applicant's arguments filed August 20, 2009 have been fully considered but they are not persuasive with respect to the rejections set forth in this action.

With respect to the rejection of claim 78 and dependents under 35 U.S.C. 112, first paragraph, for lack of enablement, applicant argues that claim 78 has been amended to more closely correspond to the description in paragraphs [0071]-[0072]. Applicant further argues that paragraph [0072] describes some exemplary organometallic compounds which can be used as optically activated dopants, and that such organometallic compounds are known in the art. Applicant argues that the determination of suitable metals and/or ligands for such compounds

would not require undue experimentation. Applicant's arguments are not persuasive. Paragraph [0072] generically teaches "organometallic compounds such, for example, Ir, Re, Os, Pt or Au complexes" and does not describe any specific organometallic compound. Applicant has not identified any art of record identifying the compounds that applicant argues are known in the art that would be suitable for the embodiment of claim 78 and dependents.

With respect to the rejection based on Lim '569, applicant argues that in the rejected claims, the dopant is only an organometallic compound or a metallocene, not a mixture of substances. Applicant's arguments are not persuasive because the present claim language is open. Each of the rejected independent claims is drawn to an "electron transporting material comprising an organic matrix and a dopant" (emphasis added). While independent claims 6, 31 and 36 further define said dopant as an organometallic compound, and independent claim 46 further defines said dopant as a metallocene, the open claim language does not exclude multiple dopants (or multiple organic matrices, or components other than an organic matrix and an organometallic compound/metallocene dopant).

With respect to the rejections based on Hsieh '906, applicant argues that the oxidized oligo-metallocene compound described in Hsieh is a cationic component of a salt and is not capable of transferring electrons to an organic matrix. Applicant argues that the oxidized oligo-metallocene compound described by Hsieh is an electron acceptor rather than an electron donor. It is not clear to the examiner why the oxidized oligo-metallocene would be incapable of transferring electrons and thus outside the scope of the dopant required by the present claims, particularly given the language of present claims 9 and 10. The examiner also notes that m^+ of

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the oxidized oligo-metallocene salt is defined by Hsieh as “less than or equal to $n+2$ ”. It is the examiner’s position that at least in the case where $m+$ is less than $n+2$, the oxidized oligo-metallocene is capable of transferring electrons. (Even in the case of $m+$ being equal to $n+2$, it is not clear to the examiner that the oxidized oligo-metallocene would necessarily be incapable of transferring electrons.)

With respect to the rejection based on Swager ‘355, applicant argues that while the polymer of Swager’s claim 1 may include metals within the repeating structural unit of the polymer, the polymer is not doped with an organometallic compound. Applicant argues that the metals form part of the elements of the polymer backbone, and Swager does not suggest covalently attaching an organometallic compound to the conducting polymer of Swager’s claim 1. The examiner respectfully disagrees that there is a clear patentable distinction between Swager’s polymers, in which metallocenes are incorporated into the main chain of the polymers, and polymers within the scope of the present claims wherein an organometallic compound (the dopant) is covalently attached to a polymer. The metallocenes of Swager’s polymers are covalently attached to the polymers.

13. Applicant’s amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday and Wednesday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

/Marie R. Yamnitzky/
Primary Examiner, Art Unit 1794

MRY
December 04, 2009